

**Silica sand
abrasive being
entrained into a
water jet. The
water jet (10,000
psi, 20 gpm) is
moving from the
left to the right.**

*Magnification = 2X. Photograph
courtesy of David Swanson, U.S.
Bureau of Mines.*

Application Of High And Ultra-High Pressure Water Jetting To Coatings And Linings Removal

by Lydia Frenzel

Since 1985, the application of water jetting at pressures above 10,000 psi to the removal of coatings on industrial structures has been gaining slow but sure acceptance in the petrochemical, marine, and commercial sector. This acceptance has been relatively slow due to the lack of recognition of the critical requirement to remove invisible salts and chemicals from the surface in the surface preparation specifications.

On April 12, 1995, the Northern California Section of the Steel Structures Painting Council (SSPC) had a three-person program dedicated to water jetting. In past years, the mood of the audience at SSPC discussions would be one of skepticism with the foregone conclusion that water jetting was impractical. In April, the audience stayed and asked questions. Almost all had seen or heard of water jetting and knew that it was coming into its own as a beneficial method of surface preparation for previously painted surfaces, elastomeric coatings removal, or removal of heavy rust. Dry grit blasting will undoubtedly remain the method of choice for new construction.

Dr. Lydia Frenzel, Sutter Creek, California, discussed the status of the standards for surface preparation involving water jetting and air/water/abrasive blast cleaning. In recent years, Dr. Frenzel has persisted in bringing the message of invisible

Conference Issue

| | |
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Apply Now For WJTA Scholarship Awards

Applications for the Water Jet Technology Association's 1995 Scholarship Awards will be accepted through **July 21, 1995**. Applicant eligibility is limited to WJTA members in good standing. Award selection will be based on financial need.

Funds are available this year for a very limited number of scholarships that will cover the cost of the registration fee for the 1995 American Water Jet Conference. The WJTA Scholarship Committee will review applications and select qualified recipients of WJTA's scholarship awards.

All applicant information is strictly confidential. To obtain an application, contact the: Water Jet Technology Association, 818 Olive Street, Suite 918, St. Louis, MO 63101-1598, phone: (314)241-1445, fax: (314)241-1449.

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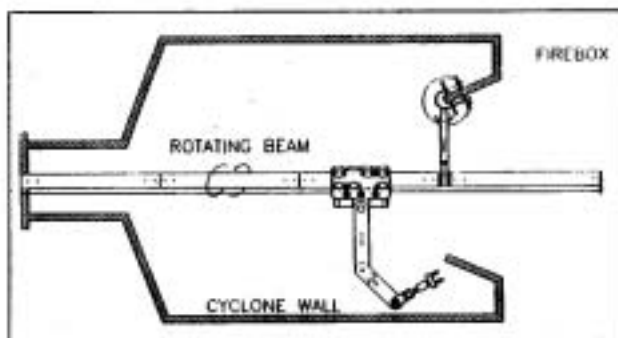
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A Programmable Articulating Cyclone Cleaner

CH. Heist Corp. has put into operation the first programmable and articulating cleaning system for coal fired cyclone furnaces used in the power generating industry.

This patented cleaning system design uses a 10,000 psi water jet

with flows greater than 80 gpm to cut away both slag and refractory from the walls of the cylindrically shaped cyclones. Performance on the first 27 cyclones cleaned showed a reduction in cleaning time of 67 to 75 percent over manual cleaning times.



This diagram of the Heist Cyclone Cleaner illustrates the rotating beam and the flexibility of the arm.

A cyclone furnace is a horizontal cylinder, with a seven to ten-foot inside diameter, made up of boiler tubes and lined with refractory, held in place with studs. Air and pulverized coal are introduced tangentially into the cylinder creating a cyclonic effect. Combustion occurs in the cyclone and the hot gases exit through a cone and enter the main firebox. The results of the combustion process cause problems in the cyclone both of internal slag buildup and refractory damage due to erosion. During maintenance, removal of slag is always required and removal of both slag and refractory is frequently needed.

Historically, this work has been done with water jet shotguns and required multiple shotgun operators to work in the enclosed space while standing on an irregular surface. Current equipment designed to clean cyclones is much slower than the Heist design, and is unable to effectively clean the end walls and both sides of the cone portion of the cyclone.

The Heist cleaning system consists of a rotating beam that is easily mounted down the center axis of the cyclone. On the beam is a powered carriage that acts as the shoulder joint for an articulating arm. Besides the shoulder joint, the arm comprises elbow and wrist joints. At the end of the arm is a nozzle head which may be either fixed or rotating. The rotatory nozzle removes a strip of slag and refractory about six inches wide on each pass. The hydraulically powered system is controlled by a programmable controller that allows the operator to monitor and control two systems at once without ever entering either cyclone. Nozzles and the nozzle head can be changed from outside the cyclone. With this design, the system components combine to provide accurate cleaning plus the flexibility to clean the entire cyclone surface and out into the firebox.

Overall performance of the Heist Cyclone Cleaner has been outstanding with respect to both job safety and productivity. Moving a unit from one cyclone to the next has taken as little as 90 minutes. Easy setups combined with leapfrogging units allow for almost continuous pump operation and maximum production. Recently, several ten-foot diameter cyclones were completely de-slaged and refractory completely removed in sixteen hours each, including setup time. Heist's immediate plan is to continue expanding into this market.

The Water Jet Technology Association's
8th American Water Jet Conference

August 26-29, 1995 • JW Marriott Hotel • Houston, Texas



Houston, Texas, site of the 1995 WJTA Conference.

WJTA Conference Checklist

Have you:

- ✓ registered for the Conference? Refer to the schedule of events below and the technical program beginning on page 6. To register, complete the registration form on page 13. ☐ Yes ☐ No
- ✓ made your hotel reservations and received the special WJTA rate of \$90 single or double occupancy? If not, call the J.W. Marriott directly at (713)961-1500 or use the convenient form on page 12. ☐ Yes ☐ No
- ✓ made your airline or other transportation arrangements? Purchase tickets in advance to avoid high airfares. For information and reservations, contact your travel agent or call Gloria Morgan at Clayton Travel Ltd. toll-free at 1-800-221-9045. ☐ Yes ☐ No

Preliminary Schedule Of Events

Saturday, August 26

- | | |
|-----------------------|---|
| 8:30 a.m. - Noon | Short Course on the Fundamentals and Applications of Water Jet Technology |
| Noon - 1:30 p.m. | Luncheon for "Short Course" Participants |
| 1:30 p.m. - 4:30 p.m. | Short Course, cont'd. |
| 6:30 p.m. - 9:30 p.m. | Welcoming Reception In The Exhibit Hall Exhibit Opens |

Sunday, August 27

- | | |
|-----------------------|---|
| 8:00 a.m. - Noon | Applications Workshops |
| 8:00 a.m. - Noon | Research & Development Sessions |
| 9:30 a.m. - 5:00 p.m. | Exhibits |
| Noon - 2:00 p.m. | Awards Luncheon |
| 2:30 p.m. - 5:30 p.m. | Applications Workshops, <i>cont'd.</i> |
| 2:30 p.m. - 5:30 p.m. | Research & Development Sessions, <i>cont'd.</i> |
| 5:30 p.m. - 6:30 p.m. | WJTA Biennial Business Meeting |

Monday, August 28

- | | |
|------------------------|---|
| 8:00 a.m. - Noon | Applications Workshops |
| 8:00 a.m. - Noon | Research & Development Sessions |
| 9:30 a.m. - 2:30 p.m. | Exhibits |
| Noon - 2:00 p.m. | Luncheon In Exhibit Hall |
| 2:00 p.m. - 5:00 p.m. | Applications Workshops, <i>cont'd.</i> |
| 2:00 p.m. - 5:00 p.m. | Research & Development Sessions, <i>cont'd.</i> |
| 6:30 p.m. - 11:00 p.m. | Texas Theme Party |

Tuesday, August 29

- | | |
|-----------------------|---|
| 9:30 a.m. - 3:00 p.m. | Technical Tour And Field Demonstrations |
|-----------------------|---|

See These Exhibitors at the 1995 WJTA Conference, August 26-29:

Aqua-Dyne, Inc.
Autoclave Engineers Group
Barton Mines Corp.
Boride Products, Inc.
Butterworth Jetting Systems, Inc.
Chemac, Inc.
Cleaner Times Magazine
Conjet
CRS Power Flow
EBBCO, Inc.
EcoSource Garnet, Ltd.
Flow International Corp.
General Pump
Hammelmann Corp.
High Pressure Equipment Co.
Hunting MCS, Inc.
HydroChem Industrial Services
Industrial Cleaning Contractor Magazine
Ingersoll-Rand Company

J.E. Adams Industries
Jet Edge, Inc.
Jetstream of Houston, Inc.
Jeteck, Inc.
Jetting Systems & Accessories
LaPlace Equipment Co.
Minerals Research & Recovery
Ned Jet Cutting Systems, Inc.
NLB Corp.
Parker Hannifin Corp., Parflex Division (formerly Rogan & Shanley)
Pipeline Supply & Service
Power Track International
Procer Nozzlemeyer
Quantum Industries International
Reliable Pumps, Inc.
SPIR STAR
StoneAge, Inc.
Technicut
Wilco Supply Inc.

Going, going . . . almost gone! A limited number of exhibit spaces remain. Don't miss this chance to display your products and services to key purchasers of water jetting equipment and supplies. Contact Ken Carroll at the WJTA office by phone at (314)241-1445 or by fax at (314)241-1449.

A Database For Jet Cutting Technique

At the Center for Robotics and Manufacturing Systems of the University of Kentucky, Lexington, KY, an extensive data base is being developed which contains information on all aspects of the water jet cutting technique. The database includes journal articles, books, book chapters, conference papers, theses, and technical reports. Every single entry set contains the following information: author(s), year, paper title, editor, publisher, book/conference name, journal name, conference location, volume, issue, pages, and keywords.

A system of keywords is developed as well as a concept for the order of the listed references. For example, (almost) every reference is classified in relation to field of application, used materials, investigated parameters, underlying theory, analysis/observation methods used, etc.

The database consists of two parts: The first part covers the phenomena of water jet formation, drop impact, cavitation, water jet application and abrasive water jet cutting. This database contains more than 3,500 sources. After finishing, more than 6,000 references are expected. The second database contains information on solid particle erosion, indentation technique, and microfracture. This part contains about 700 references but is rapidly growing. Here, more than 2,000 references are expected.

The entire database considers, among many other sources, the Proceedings of International Symposiums/Conferences on Water Jet Technology (1972-1974), Proceedings of the U.S./American Water Jet Conferences (1981-1993), Geomechanics (1989-1993), Proceedings of the International Conference on Erosion by Liquid and Solid Impact (1966-1987), International Conference On Wear of Materials (1977-1993), the PED and FED Volumes of the ASME, the journals WEAR, Jet News, International Journal of Water Jet Technology, ASME Transact, and the Jet Cutting Bibliographies published by the BHRA Group.

The frame of the database is a commercial software "EndNote Plus." This program can be run from DOS, DOS Shell, Word Perfect Shell, and Windows, and is compatible with many text processing softwares.

Because the formation of the base is still in progress it can not be used by external users. But it would be very helpful if the readers of this paper could send bibliographical details about their recent publications, in particular conference papers and research reports, in areas related to the content of the database. An ideal support would of course be if the readers send copies of their latest publications. Hopefully, the authors will be able to present the database at the next International Conference on Jet Cutting Technology.

Please send all information to: Dr.-Ing. A.W. Momber, c/o University of Kentucky, Center for Robotics and Manufacturing Systems, Lexington, KY 40506, USA.

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8th American Water Jet Conference
Houston, Texas August 26-29, 1995

Preliminary Technical Program

SUNDAY, AUGUST 27, 1995

8:20 a.m. - 10:00 a.m. — Research Session I

1. "Borehole Mining Of Gold From Permafrost," *by A. Miller and G. Savanick.*
2. "High Pressure Water Jet Assistance Of Hard Rock Cutting Process," *by V. Jaroslav.*
3. "Abrasive Performance In Rock Cutting With AWJ And ASJ," *by M. Agus, A. Bortoluzzi, and R. Ciccu.*
4. "Tunnel Boring Machine Enhancement," *by J. Xu, D. Summers, D. Wright, and C. Peterson.*
5. "A Fracture Model For Hydrodemolition," *by A. Momber and R. Kovacevic.*

8:20 a.m. - 10:00 a.m. — Applications Session I

1. "A Historical View On Ground Improvement Utilizing Waterjet—State-Of-The-Art," *by M. Shibasaki and H. Yoshida.*
2. "High Performance, Dual Colliding Water Jet On Ground Improvement," *by M. Shibasaki, H. Yoshida, M. Tsuji, Y. Tomita, G. Zarbi, T. Kim, F. White and K. Horii.*
3. "Cutting Steel And Concrete With Ultra-High Pressure Water And Abrasive," *by M. Gracey and R. Smith.*
4. "The Application Of Water Blasting And Water Jetting In Surface Preparation Of Industrial And Marine Structures," *by L. Frenzel.*
5. "370 Sapphires For Tire Recycling," *by F. Trieb.*

10:20 a.m. - 12:00 Noon — Research Session II

1. "Analysis Of The Process Output In Abrasive Water Jet Cutting," *by H. Louis, G. Meier and J. Ohlren.*
2. "Abrasive Air Water Jet Flow Modelization," *by K. Raissi, G. Basile, A. Cornier, and O. Simonin.*
3. "Interaction Of Abrasive Water Jet With Cut Material At High Velocity Of Impact—Development Of An Experimental Correlation," *by A. Tazibt, F. Parsy, N. Abriak and B. Thery.*
4. "Experimental Estimation Of Energy Dissipative Processes In Workpieces During Abrasive Water Jet Cutting," *by A. Momber, R. Kovacevic, C. Cherukuthota, H. Kwak and R. Mohan.*
5. "Fields Of Application For Abrasive Water Suspension Jets Of Pressures From 15 To 200 MPa," *by C. Brandt, H. Louis, G. Meier and G. Tebbing.*

10:20 a.m. - 12:00 Noon — Applications Session II

Speaker

2:30 p.m. - 3:50 p.m. — Research Session III

1. "Abrasive Waterjet Cutting With A Shapejet™," *by G. Rankin and S. Wu.*
2. "Improving The Quality And The Speed Of Abrasive Water Jet Cutting," *by D. Miller and E. Claffey.*
3. "Microstructural And Mechanical Characterization Of Threaded Composite Tubes Machined Using AWJ Cutting," *by Y. Wen, M. Sheridan, D. Taggart, and T. Kim.*
4. "AWJ Needs, Trends And Usage—A Survey," *by G. Mori.*

2:30 p.m. - 3:50 p.m. — Applications Session III

1. "Control Of Substances Hazardous To Health," *by T. Grieve.*
2. "Worker's Compensation: Friend Or Foe? Ways And Means For Employers To Reduce The Costs Of Worker's Compensation Insurance Premiums," *by M. Rankin.*
3. "High Pressure Water Blast Training—A Primer For Training Your Trainer," *by L. Moers.*
4. "Development Of An Extremely Durable High Pressure Pump For Cement Suspension," *by T. Yoshida and T. Marumoto.*

4:10 p.m. - 5:30 p.m. — Research Session IV

1. "Potentiality Of Water Jet Method For Cutting Of Sheet Materials," *by T. Machida, T. Okai, J. Ozaki, H. Kawano, T. Nagai and K. Sasaki.*
2. "On The Modeling Of The Abrasive Waterjet Ductile Material Interaction," *by B. Latif and G. Basile.*
3. "Development Of An AWJ Deep Hole Drilling System For Metals," *by M. Hashish.*
4. "Abrasive Waterjet Machining Of Titanium Alloy," *by D. Arola and M. Ramulu.*

4:10 p.m. - 5:30 p.m. — Applications IV

1. "Development Of The CUSP Mining Tool For Automated Underground Excavation," *by D. Wright, W. Macneil and D. Summers.*
2. "Hydro-Demolition An Alternative Method For Concrete Removal," *by D. Bernard.*
3. "Multipurpose Mobile Plant For Demilitarization," *by M. Yeomans and H. Alba.*
4. "Abrasive Water Jets For Demilitarization Of Explosive Ordnance," *by D. Miller.*

MONDAY, AUGUST 28, 1995

8:00 a.m. - 10:00 a.m. — Research Session V

1. "Effect Of Offset Bores On The Performance And Life Of Abrasive Waterjet Mixing Tubes," by M. Nanduri, D. Taggart, T. Kim and E. Ness.
2. "Measurement Of Surface Displacements By Moiré In Abrasive Waterjet Piercing Process," by Z. Guo and M. Ramulu.
3. "Water Peening—An Advanced Application Of Water Jet Technology," by H. Tönshoff and F. Kroos.
4. "Advances In Fluidjet Beam Processing," by M. Hashish.
5. "Feasibility Study Of The Use Of Ultrahigh-Pressure Liquified Gas Jets For Machining Of Nuclear Fuel Pins," by C. Dunsky and M. Hashish.
6. "High Pressure Waterjet Application To Improve Performance Of Machining Operations," by R. Kovacevic, C. Cherukuthota and R. Mohan.

8:00 a.m. - 10:00 a.m. — Applications Session V

Speaker

10:20 a.m. - 12:00 Noon — Research Session VI

1. "Design Of A Check Valve For High Speed UHP Operation Using Finite Element Analysis," by C. Raghavan and O. Tremoulet.
2. "Study Of A Novel Nozzle Device For Generating Cavitating And Pulsed Water Jets," by M. Vijay, R. Puchala and S. Hu.
3. "Computational Fluid Dynamics Analysis And Visualization Of High Frequency Pulsed Water Jets," by M. Vijay, M. Jiang and M. Lai.

10:20 a.m. - 12:00 Noon — Applications Session VI

1. "Rocket Propellant Washout System Using A Pulsing Nozzle," by M. Gracey and B. McMillan.
2. "The Development Of A Portable WOMBAT Facility," by R. Fossey, D. Summers, P. Kalim and U. Nejib.
3. "Thermal Spray Removal With Ultrahigh-Velocity Waterjets," by S. Sisson.
4. "Thermal Coating Removal System," by D. Rainey and G. Reece.
5. "Hazardous Waste Retrieval Strategies Using A High Pressure Water Jet Scarifier," by B. Hatchell, M. Rinker and O. Mullen.
6. "The Use Of Low Reaction Dislodging Tools For Waste Retrieval From Underground Storage Tanks," by D. Summers, G. Galecki, M. Rinker, C. Christenson and J. Randolph.

2:00 p.m. - 3:20 p.m. — Research Session VII

1. "A Comparison Between Laser And AWJ Cutting Of Portuguese Marbles—A Phenomenological Study," by R. Miranda, A. Miranda and T. Kim.
2. "Numerical Simulation Of Striation Formation On Water Jet Cutting Surface," by Y. Fukunishi, R. Kobayashi and K. Uchida.
3. "Development Of Icejet Machining Technology," by E. Geskin, L. Tismenetskiy, F. Li, and M. Uscitsky.
4. "Physical Analysis Of The Energy Balance Of The High Energy Liquid Jet Collision With Brittle Non-Homogeneous Material," by L. Hlavá, P. Martinec, L. Sitek and T. Sochor.

2:00 p.m. - 3:20 p.m. — Applications Session VII

1. "Direct Drive Pumps Improve Competitiveness Of Ultrahigh-Pressure Waterjets For Surface Preparation & Industrial Cleaning," by R. Schmid.
2. "Waterjet Cost Effectiveness: Case Studies In Cutting And Coating Removal," by J. Shunk.
3. "Development Of A Windows-Based Expert System For Abrasive Waterjet Cutting," by P. Singh.
4. "Waterjet Abrasives: Evaluating Cost Analysis Procedures," by W. Ranney Jr.

3:40 p.m. - 5:00 p.m. — Research Session VIII

1. "Observation Of Submerged Abrasive-Suspension Jet Cutting For Deep Ocean Applications," by D. Alberts and M. Hashish.
2. "Improvement Of The Waterjet Based Precision Cleaning Technology," by E. Geskin, M. Ushitskiy, P. Meng, L. Tismenetskiy and M. Leu.
3. "The Use Of Self-Resonating Cavitating Water Jets For Rock Cutting," by G. Chahine, K. Kalumuck and G. Frederick.
4. "An Application Study Of Plain Waterjet Process For Coating Removal," by S. Wu and T. Kim.

Poster Session

SUNDAY, AUGUST 27, 1995 — 10:20 a.m. - 12 Noon

1. "Influence Of Assistance Of High-Pressure Water Jet In The Process Of Rock Cutting Upon The Temperature, Wear, Cutting Force And Dustiness Of The Shearer Pick Edge," by Dr. Hab. A. Klich and K. Kotwica.
2. "Relations Between Water Jet Erosion And Compression Testing Of Concrete," by A. Momber, R. Kovacevic, D. Pfeiffer and R. Schönmann.
3. "A Generalized Abrasive Water Jet Cutting Model," by A. Momber.
4. "A Simplified Mathematical Energy Dissipation Model For Water Jet And Abrasive Water Jet Cutting Processes," by A. Momber.
5. "Test Research Of Super High Pressure Reciprocating Seal Under 300 MPa," by S. Xue, W. Huang and Z. Chen.
6. "Computational Fluid Dynamics Analysis Of Submerged Turbulent Jet Flowfield Of Organ-Pipe Nozzle," by W. Zhiming and S. Zhonghou.
7. "Some Advances In The Passive Control Technology Of Submerged Water Jet Flowfield," by W. Zhiming and S. Zhonghou.

MONDAY, AUGUST 28 1995 — 8:00 a.m. - 10:00 a.m.

8. "Cutting Refractory Ceramics With Abrasive Water Jets—A Preliminary Investigation," by A. Momber, I. Eusch and R. Kovacevic.
9. "Impulsive Water Jet Under Water," by G. Atanov and A. Semko.
10. "Producing Impulsive Water Jets To Extinguish Underground Fires," by G. Atanov and E. Evseeva.
11. "Empirico-Analytical Investigations Of Coal Seams Breaking Process With Plain Water Jets," by B. V. Radjko.

Candidates Sought For 1995 WJTA Awards

You are invited to submit candidates for these special awards that are presented biennially by the Water Jet Technology Association to honor a company, organization or individual who has made a significant contribution to the industry through accomplishments that directly enhance water jet technology and the industry as a whole.

Candidates must be received no later than July 14, 1995. The award recipient, to be selected by the Awards Committee of the Water Jet Technology Association, will be honored at a presentation ceremony on Sunday, August 27, 1995, in conjunction with the 8th American Water Jet Conference in Houston, Texas.

Following is an official form for candidate nominations. Complete one form for each nomination submitted. Please make additional copies of the form as needed. Nominations providing complete written information specified on the form may be faxed to (314)241-1449 or mailed to the Water Jet Technology Association, 818 Olive Street, Suite 918, St. Louis, MO 63101-1598, USA.

1995 WJTA Awards Nomination Form

Instructions: Complete sections below and submit a narrative (300-word maximum) to support your nomination on a separate sheet of paper. Please print or type all information.

I nominate the following company, organization, or person as a candidate to receive a 1995 WJTA Award (CHECK ONE AWARD):

☐ **Distinguished Pioneer Award**

The nominee must:

- Have made contributions to the water jetting industry;
- Have made contributions to the achievement of the goals of WJTA;
- Have high moral character;
- Have strong personal and business ethics;
- Be dedicated to the future of the water-jetting industry and to the growth of WJTA.

☐ **Service Award**

How has the nominated company, organization or individual contributed in time and talent toward improvement in the Water Jet Technology Association?

☐ **Safety Award**

What has the nominated company, organization or individual done to introduce new and innovative ideas in safety? This could include, but is not limited to new products, new concepts, new safety techniques . . . any unique activity which increases the overall safety of water jetting equipment.

☐ **Technology Award**

What has the nominated company, organization or individual done to introduce new and innovative ideas in engineering or manufacturing? This could include, but is not limited to, new products, new manufacturing techniques, patents . . . any unique activity that advanced the technology of the water jetting industry.

Candidate: _____

Company: _____

Address: _____

City/State/Zip: _____ **Country:** _____

Daytime Phone: (____) _____ **Fax:** (____) _____

Candidate Submitted By: _____

Company: _____

Address: _____

City/State/Zip: _____ **Country:** _____

Daytime Phone: (____) _____ **Fax:** (____) _____

Signed: _____ **Date:** _____

Nominations must be received no later than July 14, 1995. For a prompt response, fax completed form to (314)241-1449, or mail to the WJTA, 818 Olive Street, Suite 918, St. Louis, MO 63101-1598, USA.

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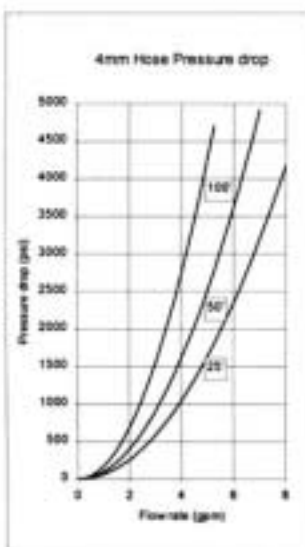
Bulletin 4660 PLX
May 1995



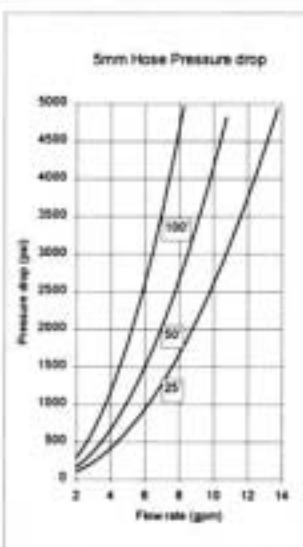
**The strength of steel
The flexibility of hose**

Pressure Drop vs Flow Rate

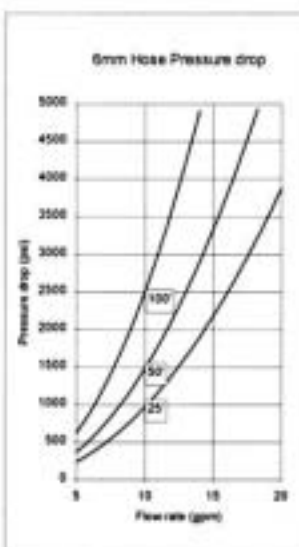
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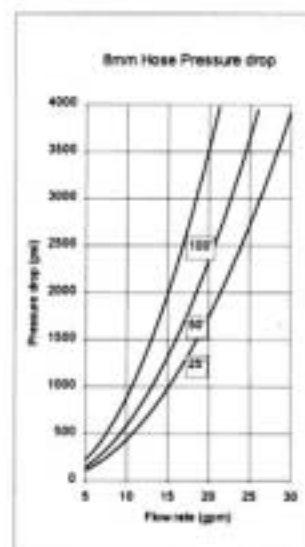
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See Spec. Sheet for 6005 ST



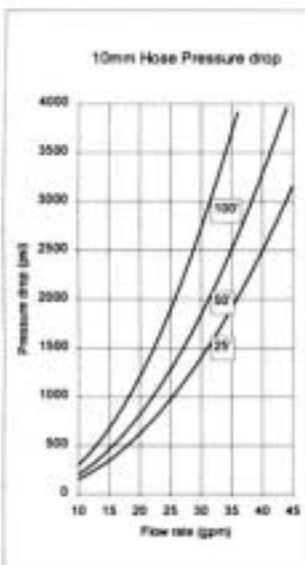
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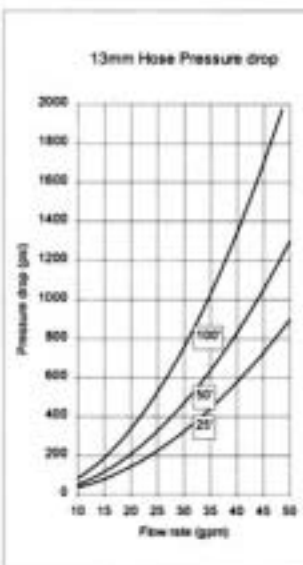
2108 ST 4008 ST
6108 ST



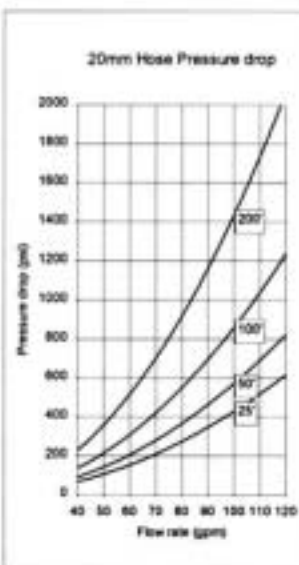
2210 ST



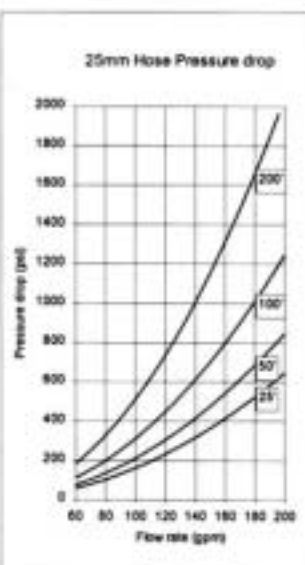
2013 ST 2113 ST
2213 ST 4113 ST
6013 ST



2220 ST 4120 ST
6020 ST



2025 ST 2225 ST
4125 ST



*** NOTE ***

Results obtained from actual pressure drop tests using water.
All hose assemblies with normal end fittings at each end.



4263 Dacoma
Houston, Texas 77092
Phone# 713-686-5236
Fax# 713-686-1292
Toll Free - 800-446-5236

Accessories

Heavy Duty Abrasion Cover

Extend the life of your hose.

Heavy Duty Abrasion Covers are designed to help protect the hose from excessive wear due to cuts, abrasion or scuffing. Made of a high quality clear PVC or Vinyl.



Bend Restrictors

Protect against abuse.

Reduces bending stress in the hose near the coupling. No adhesives or clamps are required to hold bend restrictors in place. Available in PVC or Plated Steel Springs.



Support Grips

Support.

Used to hold the weight of the hose as it hangs in a vertical, sloping or horizontal position. Made of high grade, non magnetic tin coated bronze strand.



Containment Grips

Safety First.

Containment Grips are used to limit hose whipping in the event of connection failure. They will reduce the possibility of serious injury to personnel and damage to equipment. Made of stainless steel with double weave mesh construction.



Each individual hose assembly is guaranteed to have been fully pressure-tested to 1.5 times the maximum working pressure. Every assembly is serial numbered for complete traceability.

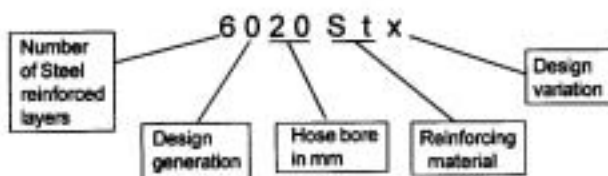


Parker Hannifin Corporation
Parflex Division
4263 Dacoma
Houston, Texas 77092-8607
Phone (713) 686-5236
(800) 446-5236
Fax (713) 686-1292

PARKER / POLYFLEX HOSE



Hose Part Numbering System



1000 Series

Light weight, very flexible hose with a single braided layer of aramid fiber (MK) or steel (K).

| Type | Hose Size (in) | | Nipple Insert ID | Pressure Rating (psi) | | Min. Bend Radius (in) | Weight lb/ft |
|---------|----------------|------|------------------|-----------------------|---------|-----------------------|--------------|
| | ID | OD | | Burst | Working | | |
| 1003 MK | 0.11 | 0.23 | 0.08 | 23,200 | 9,280 | 1.17 | 0.25 |
| 1006 K | 0.25 | 0.46 | 0.15 | 18,000 | 7,200 | 1.57 | 1.74 |

2000 Series

Very light, flexible hoses with low volumetric expansion. New generation 2200 Series hoses feature outstanding flexibility and kink resistance.

| Type | Hose Size (in) | | Nipple Insert ID | Pressure Rating (psi) | | Min. Bend Radius (in) | Weight lb/ft |
|----------|----------------|------|------------------|-----------------------|---------|-----------------------|--------------|
| | ID | OD | | Burst | Working | | |
| 2006 ST | 0.25 | 0.50 | 0.17 | 26,000 | 10,400 | 3.5 | 0.17 |
| 2006 STA | 0.25 | 0.50 | 0.17 | 33,000 | 13,200 | 3.5 | 0.17 |
| 2013 ST | 0.50 | 0.81 | 0.35 | 21,000 | 8,400 | 5.5 | 0.35 |
| 2025 ST | 1.00 | 1.34 | 0.72 | 16,000 | 6,400 | 10.0 | 0.74 |
| 2032 ST | 1.26 | 1.73 | 1.05 | 16,000 | 6,000 | 15.7 | 1.23 |
| | | | | | | | |
| 2104 ST | 0.16 | 0.39 | 0.08 | 43,500 | 17,400 | 2.5 | 0.15 |
| 2106 ST | 0.25 | 0.54 | 0.13 | 41,000 | 16,400 | 3.5 | 0.19 |
| 2108 ST | 0.32 | 0.62 | 0.18 | 34,000 | 13,600 | 3.5 | 0.20 |
| 2113 ST | 0.50 | 0.87 | 0.35 | 31,000 | 12,400 | 6.0 | 0.48 |
| | | | | | | | |
| 2206 ST | 0.25 | 0.52 | 0.13 | 30,000 | 12,000 | 3.0 | 0.18 |
| 2210 ST | 0.40 | 0.70 | 0.23 | 25,810 | 10,300 | 3.0 | 0.28 |
| 2213 ST | 0.50 | 0.81 | 0.35 | 26,000 | 10,400 | 4.0 | 0.38 |
| 2220 ST | 0.81 | 1.14 | 0.56 | 22,300 | 8,100 | 6.0 | 0.63 |
| 2225 ST | 1.00 | 1.37 | 0.69 | 18,420 | 6,500 | 8.0 | 0.84 |

4000 Series

Widely used for pressure testing, lubrication systems, high pressure hydraulic tools. Types 4005 through 4113 are ideal for 20,000 psi waterblasting.

| Type | Hose Size (in) | | Nipple Insert ID | Pressure Rating (psi) | | Min. Bend Radius (in) | Weight lb/ft |
|---------|----------------|------|------------------|-----------------------|---------|-----------------------|--------------|
| | ID | OD | | Burst | Working | | |
| 4004 ST | 0.15 | 0.37 | 0.10 | 75,000 | 30,000 | 3.9 | 0.13 |
| 4005 ST | 0.20 | 0.43 | 0.11 | 65,000 | 26,000 | 5 | 0.17 |
| 4006 ST | 0.25 | 0.50 | 0.15 | 56,250 | 22,500 | 6 | 0.19 |
| 4008 ST | 0.33 | 0.61 | 0.21 | 57,500 | 23,000 | 7 | 0.23 |
| 4113 ST | 0.50 | 0.88 | 0.34 | 51,000 | 20,400 | 8 | 0.54 |
| 4120 ST | 0.81 | 1.19 | 0.63 | 37,500 | 15,000 | 10 | 0.80 |
| 4125 ST | 1.00 | 1.46 | 0.75 | 32,620 | 13,050 | 12 | 1.00 |

6000 Series

Versatile alternative to rigid tubing. Widely used for higher pressure water jetting and other high flow, high pressure applications.

| Type | Hose Size (in) | | Nipple Insert ID | Pressure Rating (psi) | | Min. Bend Radius (in) | Weight lb/ft |
|----------|----------------|------|------------------|-----------------------|---------|-----------------------|--------------|
| | ID | OD | | Burst | Working | | |
| 6004 ST | 0.15 | 0.42 | 0.08 | 101,500 | 40,600 | 8 | 0.20 |
| 6005 ST | 0.20 | 0.50 | 0.10 | 90,620 | 36,250 | 6 | 0.25 |
| 6005 STV | 0.20 | 0.58 | 0.10 | 90,620 | 36,250 | 7 | 0.27 |
| 6108 ST | 0.33 | 0.68 | 0.20 | 90,000 | 36,000 | 8 | 0.42 |
| 6013 ST | 0.50 | 0.97 | 0.34 | 65,000 | 26,000 | 12 | 0.79 |
| 6020 ST | 0.80 | 1.30 | 0.56 | 50,750 | 20,300 | 14 | 1.23 |
| 6025 ST | 0.98 | 1.57 | 0.70 | 45,310 | 18,125 | 15 | 2.00 |

8000 Series

Highest working pressure hose, used for Water Jet Cutting and other extreme pressure applications.

| Type | Hose Size (in) | | Nipple Insert ID | Pressure Rating (psi) | | Min. Bend Radius (in) | Weight lb/ft |
|----------|----------------|------|------------------|-----------------------|---------|-----------------------|--------------|
| | ID | OD | | Burst | Working | | |
| 8005 ST | 0.20 | 0.57 | 0.10 | 120,000 | 47,400 | 12.0 | 0.35 |
| 8005 ST* | 0.20 | 1.57 | 0.10 | 120,000 | 60,000 | 12.0 | 1.23 |

*With Burst Shield

Small Hoses and Flexible Lances for Waterblasting

1000 & 2000 Series Flexible Lances

Rugged, kink resistant flexible lances offer very small diameters and minimal pressure drop. STV hoses with added outer stainless steel braided cover.

| Type | Hose Size (in) | | Nipple Insert ID | Pressure Rating (psi) | | Min. Bend Radius (in) | Weight lb/ft |
|----------|----------------|------|------------------|-----------------------|---------|-----------------------|--------------|
| | ID | OD | | Burst | Working | | |
| 1003 K | 0.14 | 0.27 | 0.08 | 20,300 | 8,000 | 1.17 | 0.17 |
| 2004 STR | 0.17 | 0.31 | 0.10 | 40,600 | 15,000 | 3.0 | 0.06 |
| 2005 STR | 0.20 | 0.42 | 0.13 | 40,600 | 15,000 | 3.5 | 0.13 |
| 2006 STA | 0.25 | 0.50 | 0.17 | 33,000 | 13,200 | 3.5 | 0.17 |
| | | | | | | | |
| 2004 STV | 0.17 | 0.36 | 0.10 | 40,600 | 15,000 | 4.0 | 0.13 |
| 2005 STV | 0.20 | 0.42 | 0.13 | 40,600 | 15,000 | 4.5 | 0.14 |
| 2006 STV | 0.25 | 0.50 | 0.17 | 35,000 | 14,000 | 5.0 | 0.20 |

* Ask about the new Pro-Lance fittings.



Parker Hannifin Corporation
 Parflex Division
 4263 Dacoma
 Houston, Texas 77092-8607
 Phone (713) 686-5236
 (800) 446-5236
 Fax (713) 686-1292

Pressure Ratings for Hose End Fittings



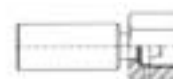
#12-28 (female)
15,000 psi rated



NPT Female (1/16" & 1/8" only)
15,000 psi rated



JIC
-4, -6, -8, -12, & -16
10,000 psi rated



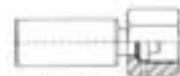
Type "M" Swivel
Rated to full working
pressure of hose.



5/16"-32 Female
15,000 psi rated



NPT Male (1/16" & 1/8" only)
15,000 psi rated



BSP Female Swivel
1/4" & 3/8"
Rated to full working
pressure of hose



Female Swivel
Medium Pressure
3/8" (20,000 psi rated)



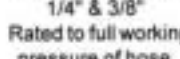
Tube Nipple
Medium Pressure
3/8", 9/16", 3/4", & 1"
20,000 psi rated



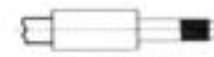
5/16"-32 Male
15,000 psi rated



NPT Male (Hex)
(1/4", 3/8", & 1/2" - 15,000 psi rated)
(3/4" & 1" - 10,000 psi rated)



Female Swivel
High Pressure
1/4" (60,000 psi rated)



Tube Nipple
High Pressure
1/4", 3/8", & 9/16"
60,000 psi rated

Fittings and Adaptors

| Description | Description Number | |
|-------------|--------------------|----------|
| | Female End | Male End |
| 1/4" NPT | NFB | NMB |
| 3/8" NPT | NFC | NMC |
| 1/2" NPT | NFD | NMD |
| 3/4" NPT | NFF | NMF |
| 1" NPT | NFH | NMH |

| Description | Description Number | |
|-------------|--------------------|----------|
| | Female End | Male End |
| 1/4" MP | LF4 | LM4 |
| 3/8" MP | LF6 | LM6 |
| 9/16" MP | LF9 | LM9 |
| 3/4" MP | LF12 | LM12 |
| 1" MP | LF16 | LM16 |

| Description | Description Number | |
|-------------|--------------------|----------|
| | Female End | Male End |
| 1/4" HP | HF4 | HM4 |
| 3/8" HP | HF6 | HM6 |
| 9/16" HP | HF9 | HM9 |

How to order your fittings

Requirement: 1/2" NPT Female x 3/8" Medium Pressure Male
Order - **NFDLM6**

High Pressure Tees, Elbows, Crosses and Valves also available.

(See the Parker / Polyflex catalog or call your representative for details.)

* See the Parker / Polyflex catalog or call your representative for more details.

Twin Lines & Bundles



The process of joining two hoses together (**TWINLINE**) for applications like:

Industrial and Rescue Equipment, Hydraulic Tools and Compressed Natural Gas.

Hose color coding for easy identification is an important feature that is available with Polyflex Twinlines.

Every "TWINLINE" assembly is fully tested and individually serial numbered for 100% traceability.

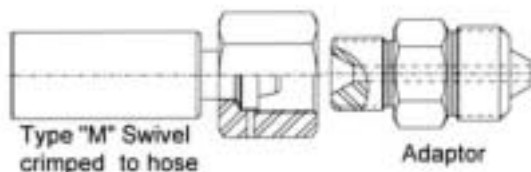
(Contact Parker / Polyflex for your specific needs.)

HIGH PRESSURE, LONG LENGTHS, LIGHT WEIGHT and FAST RESPONSE TIMES are features that account for the success of the Parker / Polyflex hose umbilicals in subsea applications.



Parker / Polyflex's unique manufacturing process can produce **very long single lengths** of steel reinforced thermoplastic hose with very low volume expansion characteristics.

Type "M" Adaptors



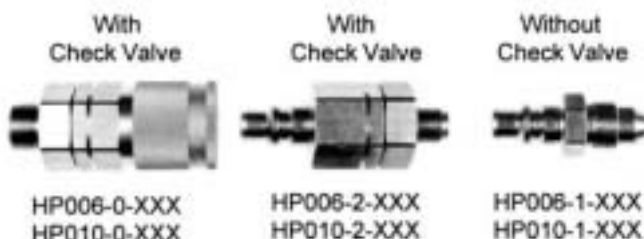
| Type "M" Swivel End Size | | | | | | |
|--------------------------|----------|-------------------|-------------------|-------------------|-----------------|----------------------|
| | | A9 9/16"-18thd | A12 3/4"-16thd | A14 7/8"-14thd | A16 1"-12thd | A21 1 5/16"-12thd |
| H O S E | 2005 STR | 2206 ST | 2108 ST | 6108 ST | 2113 ST | 2220 ST |
| | 2006 ST | 2106 ST | 2210 ST | | 2013 ST | 2225 ST |
| | 2006 STA | 4005 ST | 4008 ST | | 2213 ST | 2025 ST |
| | 2006STV | 4006 ST | | | 4113 ST | 4120 ST |
| | 2104 ST | 6005 ST | | | 6013 ST | 4125 ST 6020 ST |

| Type "M" Adaptor | National Pipe Tapered | | | | | | | Medium Pressure | | | | | High Pressure | | |
|------------------------|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------------|-----------|-----------|------------|------------|---------------|-----------|-----------|
| | 1/4MNPT | 3/8MNPT | 1/2MNPT | 3/4MNPT | 1MNPT | 1 1/4MNPT | 1 1/2MNPT | 1/4MPM | 3/8MPM | 1/2MPM | 3/4MPM | 1MPM | 1 1/4HPM | 3/8HPM | 1/2HPM |
| A9 - | A9 - NMB | A9 - NMC | A9 - NMD | | | | | A9 - LM4 | A9 - LM6 | A9 - LM9 | A9 - LM12 | | A9 - HM4 | A9 - HM6 | A9 - HM9 |
| A12 - | A12 - NMB | A12 - NMC | A12 - NMD | A12 - NMF | A12 - NMH | | | | A12 - LM6 | A12 - LM9 | A12 - LM12 | A12 - LM16 | | A12 - HM6 | A12 - HM9 |
| A14 - | | | | | | | | | | | | | | A14 - HM6 | A14 - HM9 |
| A16 - | | A16 - NMC | A16 - NMD | A16 - NMF | A16 - NMH | | | | | A16 - LM9 | A16 - LM12 | A16 - LM16 | | | A16 - HM9 |
| A21 - | | | A21 - NMD | A21 - NMF | A21 - NMH | A21 - NMJ | A21 - NMK | | | A21 - LM9 | A21 - LM12 | A21 - LM16 | | | |

* For more adaptors see the Parker / Polyflex catalog

Quick Connect Couplings

"HP" Series



| Type | Max. Working Pressure (psi)* | Test Pressure (psi) | Nominal Thru Hole Diameter (in) |
|-------|------------------------------|---------------------|---------------------------------|
| HP006 | 30,000 | 35,000 | 0.24 |
| HP010 | 20,000 | 25,000 | 0.40 |

* Connected or disconnected

xxx - Indicates thread form required. (See Parker/Polyflex's catalog or call your representative for details.)



"C" Series

| Type | Max. Working Pressure (psi)* | Test Pressure (psi) | Nominal Thru Hole Diameter (in) |
|------------|------------------------------|---------------------|---------------------------------|
| Series 115 | 14,500 | 21,800 | 0.11 |
| Series 116 | 21,800 | 29,000 | 0.11 |
| Series 125 | 29,000 | 36,300 | 0.11 |

*Connected only

xxx - Indicates thread form required.
(See Parker/Polyflex's catalog or call your representative for details.)



4263 Dacoma
Houston, Texas 77092
Phone# 713-686-5236
Fax# 713-686-1292
Toll Free - 800-446-5236

THE LYDIA FRENZEL CONFERENCE SERIES

WATER JETTING, WATER BLASTING

MARINE, UTILITY, CHEMICAL, AND TRANSPORTATION INDUSTRIES

THE CONFERENCE

Procurement Specifications and Work Procedures for the use of air/water/abrasive blast cleaning and high pressure water jetting for surface preparation before coating and lining operations on industrial facilities will be covered in the course.

FOCUS OF THE COURSE: TO ELIMINATE INVISIBLE SALT PROBLEMS

- ⇒ Joint SSPC/NACE Specifications
Navy Interim Specifications
International Specifications
- ⇒ Visual Appearance
- ⇒ Influence of Invisible Salts on Coatings
Performance
- ⇒ Containment / Environmental
considerations

There will be an open session for questions on water blasting and water jetting.

LOCATION: August 26, Day's Inn Hobby
8511 Airport Blvd.
Houston, TX
August 30, Aqua-Dyne Conf. Room
3620 W. 11th Street
Houston, TX

DATE:

TIME: 8:00 AM to 4:30 PM

AGENDA

| | |
|---------|---|
| 8:00 AM | Coffee, Sign-In |
| 8:30 | Work Procedures Procurement Specifications Intro to Invisible Contaminants |
| 9:00 | Discussion of Air/Water/ Abrasive Cleaning, and Water/Abrasive Cleaning |
| 10:00 | Water Jetting Surface Preparation Definitions Safety Considerations Lunch and Demonstration |
| 11:30 | Visual Appearance |
| 1:00 PM | Non-visible Contaminants Detection and Measurement Methods to Extract Salts |
| 2:00 | Environmental & Containment Surface Tolerant Coatings |
| 2:30 | Open Discussions |
| 3:00 | End |
| 4:00 | |
| 4:30 | |

WHO SHOULD ATTEND

Specifiers
Inspectors
Environmental
Project Managers
Engineers

Facility Owners
Painting Contractors
Quality Assurance
Compliance Managers
Designers

REASONS TO ATTEND

- ⇒ This is the only water jetting and blasting seminar exclusively designed for the coatings industry.
- ⇒ A comprehensive course manual is supplied, saving you time and money.
- ⇒ Important opportunities to NETWORK with industry leaders.
- ⇒ PROFESSIONAL LEADERSHIP: Enhance your understanding of new techniques in a rapidly changing world.

SPEAKER: DR. LYDIA M. FRENZEL

A dynamic and well known speaker, Dr. Frenzel has 20 years experience in coatings, failure analysis, and consensus standards development. From her wealth of knowledge, experience, and connections, you will discover for yourself ideas and answers to shorten the learning curve in the most economic and efficient manner. As a recognized authority and subject matter expert resource, she has co-chaired SSPC-NACE committees on water blasting since 1985, and is active in visual standards, containment, and non-visible contaminants. Lydia is a California Registered Environmental Assessor and is officially qualified to monitor and supervise lead-related construction projects.

IN THE NEWS:

High Pressure Water Jetting has been identified by the Navy as an economical and environmentally friendly way to eliminate the largest waste stream (used grit) in shipyard operations.

Water Blasting with solid abrasives and Water Jetting are used to remove lead based paint, marine antifoulants, and other potential hazardous coatings without the need for full containment.

European practices move toward favoring the use of water jetting as the sole means of surface preparation in maintenance.

LEARNING OBJECTIVES:

Provide an up-to-date overview of the specifications for water blasting and jetting, the effects of surface contaminants on coating life, and environmental containment as discussed for the past ten years in coatings and linings meetings.

SUPPLEMENTAL MATERIALS

- ▷ Bibliography
- ▷ Field methods for salt analysis
- ▷ Comments by coatings Mfgs.
on suitable coatings, inhibitors
- ▷ Literature from water jetting,
coatings, inhibitor manufacturers

THE LYDIA FRENZEL CONFERENCE SERIES

Continuous Improvement Initiatives
"Do the Basics Well"
Surface Preparation Quality Assurance

Registration is Easy ...

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By FAX FAX the completed form
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By Mail Complete the registration form
and mail to:
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Sutter Creek, CA 95685

Prior Conference Attendees:

P.W. Stevens Environmental
Atlantic Dry Dock
EnStar North America
Navy Personnel
PERA-CV Carrier Vessel
University of Missouri Rock Mechanics

Chevron Shipping
Mallinckrodt
Todd Shipyard
Hydro-Blasting
Meylan Enterprises

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GLOBAL INTERNET COMMUNICATIONS

Conference Dates and Locations

August 26 & 30 Houston TX

Before & after Water Jet Tech. Assoc.

October 22 Corpus Christi TX

Before ASTM D33 Utility Coatings

TBA Florida, Maryland, California, Louisiana

Your registration form and
payment information must be
received prior to class to
ensure your reservation. If you
are unable to attend, you may
send a substitute.

Water Jet Course Registration Information

COURSE ENROLLMENT IS LIMITED... PLEASE REGISTER EARLY

Method of Payment (Payable to The LYDIA FRENZEL CONFERENCE SERIES)

Name _____

Company _____

Address _____

City _____

State _____ Zip _____

Bus: Tel/FAX _____

Home: Tel/FAX _____

☐ Check ☐ Money Order ☐ Credit Card
or Authorized P.O.# _____

Credit Card ☐ VISA ☐ MASTERCARD

CARD # _____ EXP. DATE _____

COURSE DATE:

SIGNATURE _____

DATE _____

Number of persons planning to attend:
TOTAL PAYMENT (\$375.00 per person per course): = \$ _____

Registration fee includes course materials, breaks, and lunch. Participants are responsible for their hotel accommodations. If we receive written cancellation at least 15 days in advance of the course, the registration fee is refundable, less a \$0.00 service charge. If the cancellation is received up to 5 business days before the event, we will refund 50% of the paid course fee. After that date there will be no refund. In the event the course is rescheduled or cancelled by us for any reason, we are not responsible for reimbursement to registrants for non-refundable airline tickets, guaranteed hotel reservations, or similar expenses. If a program is cancelled, registrants will receive a full refund of payments for course fees.

Nominations Open For WJTA Board Of Directors

Nominations for the Water Jet Technology Association (WJTA) Board of Directors are being accepted through June 30, 1995.

The two-year terms of office of Thomas J. Kim, Josiah Phillips, George Rankin, Forrest Shook, Mohan Vijay, Ph.D., and John Wolgamott, will expire on August 27, 1995. Therefore, nominations are sought for six (6) board members, each to serve a four-year term of office beginning August 27, 1995.

According to the WJTA bylaws, each of the above-named individuals are eligible for re-nomination and re-election to the WJTA Board of Directors.

With regard to all first-time nominees, the WJTA bylaws provide that no more than one of the elected board members may be from the same company or organization. Therefore, board members may not be nominated from facilities that are already represented on the board by individuals whose terms expire in 1997. These facilities include: Conn Consulting (Andrew F. Conn, Ph.D.); Quest Integrated (Mohamed Hashish, Ph.D.); Scire Corporation (Thomas J. Labus); U.S. Bureau of Mines (George A. Savanick, Ph.D.); University of Missouri-Rolla (David A. Summers, Ph.D.); or MPW Industrial Services (Bruce Wood).

Nominations/Elections Procedures

In accordance with the bylaws of the Water Jet Technology Association, revised in 1993, nominations and elections to the Board of Directors include the following procedures:

- At least two calls for nominations to the board of directors will be published in the *Jet News*. The first call for nominations appeared in the February 1995 issue and a second call appeared in the April issue. A third call appears in this (June 1995) issue. **Nominations will be accepted through June 30, 1995.**
- An official ballot listing the eligible nominees and a brief biographical sketch for each individual will then be forwarded by mail to all eligible voting members of the Association on July 14. **Signed and executed ballots must be mailed to the Association's office for tallying by August 15, 1995.**
- The names of newly elected board members will be announced on Sunday, August 27, 1995, at the WJTA general membership meeting held in conjunction with the 8th American Water Jet Conference in Houston, Texas.

Only eligible members of the Water Jet Technology Association may submit a nomination and nominees must be eligible members of the Water Jet Technology Association.

continued on page 10

New Developments, Products, Services

A New Horizontal Shellside Cleaner For Heat Exchangers

Jetting Systems & Accessories, Inc. of Houston introduces a new heavy duty, economical shellside cleaner for heat exchangers in refineries. The innovative horizontal blasting design permits the use of lighter support structure and carriage. The modular track system affords flexibility in working length as well as portability for mobile applications. The unit is offered standard with rotating cleaning jets to optimize available horsepower. Modular deflector shields are available to contain overspray and debris.

Units are available in both hydraulic and pneumatic drive, and can also be equipped for dual side operation. For a brochure, quotation or video demonstration, call Jetting Systems at 713-939-0015.

FLOW Awarded Contract To Provide SAAB With Water Jet Cutting System

ASI Robotics, a division of Flow International Corporation, has signed a contract valued at approximately \$1 million to supply a robotic water jet cutting system to Saab, Linköping, Sweden.

Saab will utilize FLOW's PASER™ 5-axis robotic system to cut advanced composite materials for its line of commercial and military aircraft. The contract represents the first major total system sale for FLOW since it acquired two robotics manufacturers, ASI Robotics and Dynovation Machine Systems, in early 1995.

Saab will cut three-dimensional composite parts with its ASI gantry system for the JAS 39 Gripen fighter aircraft, in addition to the Saab 340 and Saab 2000 regional aircraft. The 5-axis gantry robot will include inspection, vision and other sensory equipment, consolidating several processes into one complete unit. The 25-foot x 10-foot x 3-foot work envelope features a programmable CNC controller for full automation and ease of use.

Nominations Open For WJTA Board Of Directors, from page 10

According to the WJTA bylaws, any WJTA member in good standing (1995 membership dues paid) may submit a nomination(s). Nominees must also be WJTA members in good standing. The deadline for making nominations is eight (8) weeks prior to the biennial business meeting scheduled for Sunday, August 27. Therefore, your nomination(s) should reach the WJTA office no later than **June 30, 1995**.

To submit a nomination(s), complete the form below and return to: Mohan Vijay, Ph.D., Chairman, Committee On Nomination, Water Jet Technology Association, 818 Olive Street, Suite 918, St. Louis, MO 63101-1598, Phone: (314)241-1445, Fax: (314)241-1449.

Remember, nominations must be received no later than June 30, 1995.



Nomination Form

Name Of Nominee _____
Title _____
Address _____
City _____ State _____
Country _____ Postal Code _____
Telephone () _____ Fax () _____

Attach biographical information with a brief statement of your nominee's mission and vision for WJTA.

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Application Of High And Ultra-High Pressure Water Jetting, from page 1

salts to the attention to industry. The US standards are nearing publication after ten years of preparation. In the NACE/SSPC Joint Standard for High and Ultra-High Water Jetting for Removal of Coatings on Steel and Other Hard Surfaces, definitions for various pressures are given for the coatings industry. These definitions are in agreement with those adopted by the WJTA. The intent is to give guidance in an industry where "hydroblasting" is used for equipment operating at 30 psi to 40,000 psi. Dr. Frenzel also discussed European pictorials, the U.S. Navy Interim Standard, and other activities impacting on the acceptance of water jetting and water washing of surfaces.

Dr. John Kelly, International Paint Division of Courtaulds Coatings, Houston, Texas, presented the visual standards which International published last year. The purpose of these visual pictorials is to assist technical service personnel to respond to the use of water jetting in the worldwide community when consensus standards are lacking. International Paint has issued photographs of standard surfaces after slurry blasting (water with abrasive added for cleaning) and after hydroblasting (high or ultra-high water jetting) on Type C and D steel. These visual pictorials follow the ISO and Swedish Institute of Standards definitions so that they are universally applicable worldwide. The National Association of Corrosion Engineers (NACE) and the Steel Structure Painting Council (SSPC) are moving to adopt the pictorials as interim visual standards.

Dr. Tom Aldinger, Bechtel Engineering, San Francisco, California, then presented an ongoing laboratory and field case where high pressure water jetting was used to clean pen stock of Pacific Gas and Electric (PG & E). The replacement coatings were applied over dry abrasive-cleaned and the water jet-cleaned surfaces. After coating, the pen stock was subjected to Atlas Cell testing at elevated temperatures and partial immersion. Bechtel and PG & E found that the coatings over the water jet-cleaned surfaces had a higher adhesion pull test than that of coatings over the dry abrasive-cleaned surface. They also found that when blisters formed and the coating was removed, the coating could be pulled back on the dry abrasive-cleaned surface. The coating was still tightly adherent to the water jet-cleaned surface. This study is still underway and a final report has yet to be released.

Other activities this year in which high or ultra high pressure water jetting was discussed was the National Ship Research Program SP3 meeting in January and April, at the NACE Corrosion 95 meeting in Orlando in March in the railcar, Marine transportation, and coatings sections, and the American Bureau of Shipping is including water jetting as a surface preparation of ballast tanks. The NPCA Marine Coatings Conference in Virginia Beach on June 6-9, 1995, will feature a speaker from Hamburg in a shipyard which has converted to water jetting as well as having a half-day devoted to the topic. Dr. Frenzel is writing a new half-day introduction tutorial on the various equipment systems and basic definitions to be given at the SSPC fall meeting in Dallas.

For equipment manufacturers and contractors in the US who have been trying to provide surface preparation services in low pressure water washing, air/water/abrasive cleaning, high and ultra-high water jetting cleaning, the next two years will be pivotal as the standards are adopted and published. Project managers will have new specifications to incorporate into bid documents.

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| | | | | | |
|---|--------------|--------------|--------------|--------------|------------|
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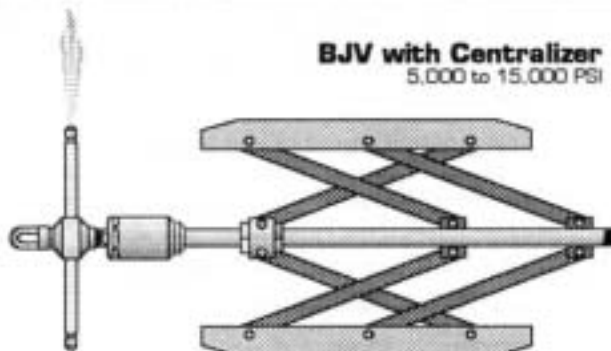
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